Charges for Distribution Services

Distributed Power Workshops
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Distribution Services

- Lower-voltage wires, transformers, substations and associated systems that take electricity from the transmission grid and deliver it to end-users
The World of Rate Design

- Regulatory Process Context
  - Rate Case
    - determines utility overall rev req.
  - Cost Allocation
    - determines revenue responsibility for each customer class
  - Rate Design
    - determines revenue responsibility for each customer
Practical Rate Design

Objectives

➢ Customer wants to pay lowest bill possible
➢ Utility wants revenue and profit stability and low risk
➢ Regulators want to make sure distribution system investment is efficient (least cost)
Historically, the costs of distribution have been recovered through usage-based prices
- Bundled with G and T
- Energy-based, as in the residential and small commercial classes
- Often demand- and energy-based for larger-volume customers
The Nature of the Costs

- Distribution costs vary widely from place to place and time to time.
- Within discrete sections of the distribution system, there are both high-cost and low-cost areas to serve.
- Utility investment in distribution is continual: new installations, upgrades, replacements.
## Illustrative Capital Costs
### Large Midwest Utility

<table>
<thead>
<tr>
<th></th>
<th>AVG. System MC $/kw</th>
<th>Area Specific High-Low $/kw</th>
<th>Annual cost @ 15% Charge Factor</th>
<th>Avg. MC Cost per kwh @ 20% LF</th>
<th>High Cost per kwh @ 20% LF</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transmission (discounted)</td>
<td>230</td>
<td>NA</td>
<td>34</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>Dist Lines</td>
<td>960</td>
<td>1575 - 0</td>
<td>140</td>
<td>8</td>
<td>13.5</td>
</tr>
<tr>
<td>Dist Trans</td>
<td>60</td>
<td>300 - 0</td>
<td>9</td>
<td>.15</td>
<td>2.5</td>
</tr>
<tr>
<td>TOTAL</td>
<td>1250</td>
<td>1875 - 0</td>
<td>183</td>
<td>10.5</td>
<td>20</td>
</tr>
</tbody>
</table>
What are the cost drivers for distribution?
- Number of Customers
- Usage - demand (KW) and energy (kWh)

What price signal is needed? A signal that allows a meaningful response by the customer.
Dilemma

If distribution costs vary widely from place to place and time to time, and if geographic deaveraging is not feasible, how then should prices be set?

REGULATORY JUDGMENT IS NEEDED!
The Competitive Market Ideal

- Prices should be set as if set by a competitive market
  - Kahn: "Regulate utilities to produce the same results as would be produced by effective competition."

- In competitive markets, price will converge on LRMC

- Ideally, prices should reflect the external costs of production and consumption
LRMC and its Minimization

- Price equal at least to LRMC is consistent with the long-run nature of investment and consumption in the sector

- Competition in distribution services is emerging
  - energy efficiency, distributed resources, CHP offer options that may be least cost distribution system investments
Must Bear In Mind

Rate design is very important
- Seemingly small changes in rate design can produce very large revenue shifts among customers
- Moving from a usage to a fixed charge shifts costs from high use to lower use customers
Conclusions

Usage-based rate design

- Promotes efficiency and innovation in supply and demand
- Recognizes avoidability of costs, including external ones
- Has established public acceptance
- Is consistent with pricing in most competitive markets